

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for processing an audio or video data stream containing digital watermark data, comprising:

utilizing a playback unit for playing out information contained in the audio or video data stream; and

during playing by the playback unit, altering the audio or video information ~~slightly~~ by applying to the audio or video data stream a predetermined mapping function associated with the playback unit ~~that is different from mapping functions associated with other playback units, to intentionally~~ to distort the audio or video content ~~by a small amount not readily perceptible to a user;~~

such that audio or video information produced by combining multiple audio ~~or~~ to video data streams corresponding to said information, from different playback units, will be perceptibly distorted.

2. (Currently Amended) The method in accordance with claim 1, configured such that ~~said the~~ information comprises a video image embedded in a video data stream, and said video image is distorted ~~slightly~~ during playback by a playback unit in accord with the predetermined mapping function by an amount not readily visible to a viewer, but such that a video image produced by combining multiple video data streams reproduced by multiple different playback units is visibly distorted.

3. (Original) The method in accordance with claim 1 or 2, configured such that said mapping function changes with time during playback of the video image by a playback unit.

4. (Original) The method in accordance with claim 1 or 2, configured such that said mapping function is selected randomly from among a plurality of mapping functions pre-stored in a playback unit.

5. (Original) The method in accordance with claim 2, configured such that the image is distorted by the playback unit by compressing spacing between pixels in one direction and expanding spacing in another direction.

6. (Original) The method in accordance with claim 2, configured such that said mapping function is changed upon scene change of said video image.

7. (Original) The method in accordance with claim 6, configured such that the mapping function is changed in a first manner within a scene, and is changed in a second manner upon a scene change.

8. (Original) The method in accordance with claim 2, configured such that said mapping function is defined by a geometric transformation

9. (Original) The method in accordance with claim 8, configured such that said mapping function is derived by backward warping of a two-dimensional geometric transformation of said video image.

10. (Original) The method in accordance with claim 8, configured such that said mapping function is derived by a three-dimensional geometric transformation of said video image.

11. (Original) The method in accordance with claim 8, configured such that said mapping function is linear.

12. (Original) The method in accordance with claim 8, configured such that said mapping function is quadratic.

13. (Original) The method in accordance with claim 8, configured such that said mapping function is a spline function.

14. (Original) The method in accordance with claim 8, configured such that a motion vector is applied to one or more pixels of said video image for image transformation.

15. (Original) The method in accordance with claim 8, in which the mapping function is obtained from a stored table.

16. (Original) The method in accordance with claim 8, in which the mapping function is obtained from a computed table.

17. (Original) The method in accordance with claim 8, configured such that different image transformations are performed in different regions of said video image.

18. (Currently Amended) A video playback unit, comprising:
an input for receiving an encoded data stream bearing a video image;
a decoder for decoding the encoded video stream; and
means for imparting a prescribed transformation to the video image for ~~intentionally~~ warping the video image in a manner, and by an amount, not readily visible to a viewer such that a composite video image produced by multiple said video playback units will be visibly distorted.

19. (Original) A playback unit in accordance with claim 18, configured such that said warping changes with time during playback of the video image.

20. (Original) A playback unit in accordance with claim 18, configured such that said warping is selected randomly from among a plurality of mapping functions pre-stored in a playback unit.

21. (Original) A playback unit in accordance with claim 18, configured such that the image is warped by compressing spacing between pixels in one direction and expanding spacing in another direction.

22. (Original) A playback unit in accordance with claim 19, configured such that said warping changes upon scene change of said video image.

23. (Original) A playback unit in accordance with claim 18, configured such that said warping is defined by a geometric transformation

24. (Original) A playback unit in accordance with claim 18, configured such that said warping is derived by backward warping of a two-dimensional geometric transformation of said video image.

25. (Original) A playback unit in accordance with claim 18, configured such that said warping is performed by a three-dimensional transformation of said video image.

26. (Original) A playback unit in accordance with claim 18, configured such that said warping is described by a linear function.

27. (Original) A playback unit in accordance with claim 18, configured such that said warping is described by a quadratic function.

28. (Currently Amended) A playback unit in accordance with claim 18, configured such that said warping ~~warping~~ is described by a spline function.

29. (Original) A playback unit in accordance with claim 18, including means for applying a motion vector to pixels of said video image for image transformation.

30. (Original) A playback unit in accordance with claim 18, including means for performing different image transformations in different regions of said video image.

31. (Withdrawn) A method of downloading digital data or software from a content provider to a user terminal, comprising:

embedding the data or software into the active region of an analog channel of an audio or video signal transmission from the content provider to the user terminal.

32. (Withdrawn) The method in accordance with claim 31, in which the analog channel is a channel of a video signal transmission carrying analog information representing a video image.

33. (Withdrawn) The method in accordance with claim 32, wherein the video transmission is in NTSC or PAL format, and the active region of the analog channel of the transmission is outside a blanking interval.

34. (Withdrawn) The method in accordance with claim 32, including embedding the data or software into a region, or the entirety, of the video image.

35. (Withdrawn) The method in accordance with claim 31 or 32, including performing error checking at the user terminal.

36. (Withdrawn) The method in accordance with claim 35, including the further step of performing error correction at the user terminal.

37. (Withdrawn) The method in accordance with claim 32, including altering an image produced by a monitor at the user terminal so as to provide a prescribed display message or blanked monitor screen while said software or data are being downloaded from the content provider.

38. (Withdrawn) In a system for processing a digital data stream containing watermark data embedded in digital data stream packs, wherein the digital data stream is produced by any of a number of different playback units each characterized by a corresponding CDMA waveform, and the digital data stream is CDMA encoded in accordance with the waveform of the playback unit from which the digital data stream is produced, a data processing method, comprising:

encoding the digital data by embedding digital data representing portions of the CDMA waveform in the digital data stream;

transmitting the encoded data; and

receiving and decoding the encoded data by retrieving embedded CDMA waveform portions and correlating retrieved CDMA waveform portions with the digital data stream.

39. (Withdrawn) The method in accordance with claim 38, wherein the embedded data includes data representing CDMA table columns.

40. (Withdrawn) The method in accordance with claim 39, wherein portions of different columns of a table are selected to comprise an equivalent single column for decoding.

41. (Withdrawn) The method in accordance with claim 38, wherein CDMA values are carried, in columns, by running mark packs within the digital data stream.

42. (Withdrawn) The method in accordance with claim 38, wherein storage of columns is made serially from the bottom of a pack upward.

43. (Withdrawn) The method in accordance with claim 39, wherein each pack carries two columns of a CDMA waveform.

44. (Withdrawn) A storage medium bearing an MPEG compatible data structure, the data structure being in the form of packs each comprising a header followed by successive data regions, at least some of which are separated by additional regions that are unused, and pointers for pointing from the header to a data region or pointing between data regions, in each case bypassing said unused region.

45. (Withdrawn) The storage medium in accordance with claim 4, including watermark data added to said unused regions of said data structure.

46. (Withdrawn) A method of searching for packets in an MPEG compatible data stream, comprising:

deriving a packet signature from the stream identification (stream_id) and presentation time stamp (PTS) as defined in an MPEG standard for packetized elemental streams (PES); and

matching said packet signature as a reference packet with target packets in the data stream.

47. (Withdrawn) A method of searching for packets in an MPEG compatible data stream, of a type in which there is no presentation time-stamp (PTS) in a packet header, comprising:

deriving a packet signature from a stream identification (stream_id) of the data stream;
obtaining an offset from an absolute location in the data stream having a signature; and
counting packets by an amount of said offset from an address having said packet signature.

48. (Withdrawn) A method in accordance with claim 46, including implementing multiple reference packets for cross-verification of matches between said reference packet and target packets.

49. (Withdrawn) A method in accordance with claim 46, including implementing information obtained from multiple packets to form a packet signature

50. (Withdrawn) A method of searching for packets in an MPEG compatible data stream, comprising:

deriving a unique packet signature from the MPEG data stream; and
matching the packet signature as a reference packet with target packets in the MPEG data stream.

51. (Withdrawn) A method of searching for packets in an MPEG compatible data stream, comprising:

counting packets from the beginning of the stream; and
identifying a target packet having a prescribed count.

52. (Withdrawn) A method of searching for packets in an MPEG compatible data stream, comprising:

adding packet numbers to packet headers within the data stream;
comparing packet header numbers with a prescribed header number from a field of private data; and
identifying a target packet having the prescribed packet header number.

53. (Withdrawn) In a system in which an MPEG video bitstream is sent from a content provider to a user terminal and tracing watermarks identifying the user terminal are inserted at the terminal into the MPEG bitstream by decompressing a portion of the bitstream and inserting the watermark into the decompressed video, a method of processing said MPEG encoded bitstream, comprising:

replacing a section of the MPEG bitstream by an auxiliary bitstream.

54. (Withdrawn) The system in accordance with claim 53, wherein said auxiliary bitstream comprises a private bitstream.

55. (Withdrawn) In a system in which an MPEG video bitstream is sent from a content provider to a user terminal and tracing watermarks identifying the user terminal are inserted at the terminal into the MPEG bitstream by decompressing a portion of the bitstream and inserting the watermark into the uncompressed video, a method of processing said MPEG encoded bitstream, comprising:

re-encoding said portion of the video to compensate for any change of said encoded bitstream length, wherein at least a portion of said re-encoding is performed by the content provider; and

placing said re-encoded portion of the video back into the MPEG bitstream.

56. (Withdrawn) In a system in which an MPEG video bitstream is sent from a content provider to a user terminal and tracing watermarks identifying the user terminal are inserted at the terminal into the MPEG bitstream by decompressing a portion of the bitstream and inserting the watermark into the uncompressed video, in which computations must be performed on the bitstream for extracting the tracking watermarks therefrom, a method of processing the bitstream, comprising:

the content provider performing some of the computations;
sending information to the user terminal describing the computations performed by the content provider; and
the user terminal performing computations depending upon said information received from said content provider.

57. (Withdrawn) The method in accordance with claim 56, wherein said user terminal is programmed to perform on the bitstream processes selected from among a set of processes, and including the step of responding to said information received from said content provider by performing on the bitstream only those processes not already performed by said content provider.

58. (Withdrawn) A method of producing watermarks to be embedded within a bitstream of MPEG video frames, comprising:
producing attribute data specifying physical attributes of spatial domain watermarks;
encoding an auxiliary bitstream with said attribute data; and
using said encoded auxiliary bitstream to embed said spatial domain watermarks into said MPEG bitstream.

59. (Withdrawn) The method in accordance with claim 58, wherein said attribute data include size, shape and location of said spatial domain watermarks.

60. (Withdrawn) The method in accordance with claim 59, wherein said spatial domain watermark comprises a polygon-shaped modification of pixel values in an MPEG video frame.

61. (Withdrawn) The method in accordance with claim 60, in which said modification includes a function of replacement, addition, multiplication or exponentiation.